



## Adoption of Agro-Forestry among Farmers in Onigambari area of Oyo State, Nigeria

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**ABSTRACT:** This study was carried out in the Onigambari area of Oyo state to determine the choice of farmers to practice Agro-forestry in the area. The  $\chi^2$  test result revealed that the educational level of the respondents correlated highly with the respondents major occupation ( $p < 0.01$ ).  $\chi^2$  test shows that there was significant relationship ( $p < 0.01$ ) between the respondents' level of education and awareness of agroforestry systems. This shows that farmers with a better educational background can accept agro forestry easily than those with lower education. Farmers' awareness of Agroforestry systems, willingness to plant trees, purpose of planting trees and desired tree species were evaluated. It was observed that 74% of the respondents are not willing to practice agroforestry while 24% shows interest. 64% confirmed they are aware of the practice while 32% had never heard of such practice. The t-test result shows a significant difference with respect to the willingness of the respondents to practice agroforestry. Of those that are aware, 38% practice agroforestry for the purpose of fuel wood, 36% as source of income while only 2% practice for the purpose of wind breaking. Eucalyptus calmodulensis, Magnifera indica, Gmelina aborea are some of the trees used for this practice in the study area. Lack of seed and scarcity of land were identified as limiting factors that prevent farmers from practicing agroforestry. In summary it was observed that the respondent's level of education correlated significantly to the level of education, also the level of education determines respondent's willingness to practice agroforestry. It is recommended that Seeds, Seedlings and land be made available to encourage the practice among farmers. Extension workers are encouraged to engage farmers more on the benefits of agroforestry.

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By intercropping trees and woody perennials with crops on farms and rangelands, agroforestry diversifies and sustains production for increased socio-economic and environmental benefits for land users at all levels (Kumar and Nair, 2006; Jose, 2009). Agroforestry offers proven potentials for increasing farm production and income. (Adekunle, 2009). It's used in poverty reduction strategies in the tropical African countries (Basamba *et al.*, 2016). Agroforestry is a "collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals. Land degradation implies a reduction or loss in arid, semiarid, and dry sub-humid areas of biological or economic productivity of land, usually resulting from land use cover change (LUCC) or processes arising from anthropogenic activities, such as soil erosion caused by long-term deterioration of natural vegetation (Mundia and Aniya, 2006). A major way to address low land productivity is the development of new agroforestry technologies. Agroforestry technologies in Nigeria have been practiced at

research stations since 1980 and also on farms since 1984 in collaboration with farmers (Franzel *et al.*, 2002). Natural fallows have been a common practice among farmers for restoring soil fertility in Africa. However, population increase and pressure on land use have reduced the effectiveness of this fallow system to below the minimum threshold required for the system to sustain itself. Hence, farmers open up forests which has led to deforestation. The findings of this research is expected to probe the factors that influence farmers choice of adopting agroforestry to enable policy makers accelerate and encourage its practice.

### MATERIALS AND METHOD

**Study Area/Data Collection:** The study was carried out in Onigambari area of Oluyole local government of Oyo State. It was established in 1976 and occupies a land mass of 629km<sup>2</sup> and a population of 202,725. Maize, Cocoa-yam, plantain and cassava are the major food crops planted in the area. Major livestock reared in the zone are cattle, sheep and goats. Questionnaires was randomly administered to 50 farmers where about

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93 farmers were identified. Simple percentage and frequency method of data analysis was used to examine the test variables and results generated.

**Study Design:** The method used for this study is survey research method. The survey method was adopted due to the nature of the research, which involves practical issues. The questionnaire was designed to determine factors influencing the adoption of agro-forestry among farmers in Gambari area. The target population comprises Onipe, Ayunre, Ibusogboro, Adebayo and Mamu area. Questionnaire was administered to a total of 50 farmers in the area. The questionnaire was designed to gather information on farmers' awareness and adoption of Agroforestry systems, their willingness to plant trees, retain trees on farmland during cultivation or take care of those planted. Information was also collected on family size(s), tree species commonly retained/planted on farmland and other vital information relevant to the study. Data obtained were analyzed using descriptive statistics that include the use of frequency distributions and percentages. Chi-square ( $\chi^2$ ) was used to test for the presence of associations in the variables obtained. Student t-test was used to ascertain the presence of significant differences between respondents' gender, proportion of those willing to practice agroforestry and those who are not willing.

## RESULTS AND DISCUSSION

Table 1 shows the age, level of education, marital status, occupation and family size of the respondents. The t-test result indicate the presence of significant differences ( $p < 0.01$ ) in age and family size distribution of the respondents. This shows that there is a wide variation in distribution of respondents over different age groups and household sizes. Majority of the respondents (42%) were found in the age group 30 – 39 years followed by 24% between 20-29 years. 60 years and above appeared to be the least age group with a percentage of 2%. Family size of (1-5) respondents (58%) has the highest family no. This does not agree with the work of Villano and Fleming (2004) that suggest that more adult members in a household means that more quality labour would be available for carrying out farming activities and the practice of agroforestry would not pose any problem. Apparently more needs to be done to encourage people to practice agroforestry and farming in general. Family size of 6-10 represents 22% while family size of 10-15 represents 20%. It can be seen in Table 1 that 68% are male and 32% female involved in agroforestry. The results of the t-test show a significant difference ( $P < 0.01$ ) in gender distribution among the respondents. Majority of the respondents are married (76%) while 14% are single and 10% divorced. The  $\chi^2$

test results revealed that the educational level of the respondents correlated highly with the respondents major occupation ( $p < 0.01$ ). The result of  $\chi^2$  test shows that there is significant relationship ( $p < 0.01$ ) between the respondents' level of education and awareness of agroforestry systems. Furthermore, Table 1 shows that 52% of the respondents had non- formal education, while primary education represents (24%) of the respondents, secondary education (16%) and tertiary education (8%). This implies that extension workers need to engage the farmers more to enable them embrace agroforestry practice. The level of education of farmers will directly affect their ability to adopt new changes and ideas (Adekunle, 2009).

**Table 1:** Identified Socio-Economic Determinants of Respondents

| Variable                   | Frequency (n=50)                               | Percentage (%) |
|----------------------------|--|----------------|
| <b>Age</b>                 |  |                |
| 20-29                      | 12   | 24             |
| 30-39                      | 21   | 42             |
| 40-49                      | 11   | 22             |
| 50-59                      | 5  | 10             |
| 60 and Above               | 1  | 2              |
| <b>T-test result</b>       | P = 0.0001, * significant (P < 0.01)           |                |
| <b>Gender</b>              |  |                |
| Male                       | 34   | 68             |
| Female                     | 16   | 32             |
| <b>Level of Education</b>  |  |                |
| Non-formal                 | 26   | 52             |
| Primary                    | 12   | 24             |
| Secondary                  | 8  | 16             |
| Tertiary                   | 4  | 8              |
| <b>Marital Status</b>      |  |                |
| Married                    | 38   | 76             |
| Single                     | 7  | 14             |
| Divorced                   | 5  | 10             |
| <b>T-test result</b>       | (P < 0.01), df = 49, P = 0.0001, * significant |                |
| <b>Occupation</b>          |  |                |
| Artisan/farming            | 16   | 32             |
| Trading/farming            | 23   | 46             |
| Farmer                     | 11   | 22             |
| <b><math>\chi^2</math></b> | P = 0.0001, * significant, (P < 0.01)          |                |
| <b>Family size</b>         |  |                |
| 1-5                        | 29   | 58             |
| 6-10                       | 11   | 22             |
| 10-15                      | 10   | 20             |
| <b>T-test result</b>       | df = 49, P = 0.0001, * significant, (P < 0.01) |                |

The result of Table 1 shows that the Bi-occupational respondents represent about 78% of the farmers' population in the study area. This means that majority of them source for fund from other occupation to support their farming venture. The implication of this is that the government needs to invest more in

agriculture to encourage more participation. Only 22% of the respondents are full time farmers.

**Table 2:** Level of Awareness and willingness to participate in Agro-forestry practice by Respondents

| Response                                   | Frequency (n=50)                        | Percentage (%) |
|--|---|----------------|
| <b>Willingness to plant trees</b>          |   |                |
| Yes  | 13                                      | 26             |
| No   | 37                                      | 74             |
| T-test                                     | P = 0.001, *<br>significant<br>(P<0.01) |                |
| <b>Awareness of Agro-Forestry practice</b> |   |                |
| Yes  | 32                                      | 64             |
| No   | 16                                      | 32             |
| <b>Purpose of Agroforestry</b>             |   |                |
| Fuel wood                                  | 19                                      | 38             |
| Windbreak fodder                           | 1                                       | 2              |
| Shade                                      | 9                                       | 18             |
| Source of income                           | 18                                      | 36             |
| Soil Improvement                           | 3                                       | 6              |
| <b>Types of Tree species desired</b>       |   |                |
| Tectona grandis                            | 32                                      |                |
| Gmelina arborea                            | 43                                      |                |
| Parkia biglobosa                           | 12                                      |                |
| Eucalyptus camuldulensis                   | 19                                      |                |
| Mansonia altissima                         | 22                                      |                |
| Magnifera indica                           | 51                                      |                |
| Azadiracta indica                          | 33                                      |                |
| Moringa oleifera                           | 22                                      |                |

Table 2: Represents the Level of awareness and willingness to participate in Agroforestry practice by Respondents. The deliberate retaining of trees on farmland was the most common agroforestry practice in the study area. The study indicates that (26%) of the farmers are willing to plant trees while (74%) are not willing. The results of the t-test (Table 2) shows a significant difference ( $p < 0.01$ ) in the proportion of those willing to practice agroforestry and those not willing. On the level of awareness of agro-forestry practice, (64%) of the respondents are aware of the practice and (32%) claimed they are not aware of agroforestry practices. The farmers that are aware of the practice only retained trees on their farm purposely for Fuelwood (38%), Wind break (2%), Shade (18%), Source of income (36%) and Soil improvement (6%). From the result of Table 2, It can be observed that the respondents in the study area retained trees on their farm to generate more income and mainly as a source of fuelwood. This is in agreement with the works of Jamala et al., (2004) and Adewusi, (2006) who both agreed that farmers plant or retain trees on their farm land, both for food, income, soil improvement, environmental amelioration and for shade during the harsh weather period. Species retained include Eucalyptus camuldulensis, Tectona grandis Linn,

Parkia biglobosa (Jacq), Gmelina arborea, Magnifera indica, Azadiracta indica, Moringa oleifera Lam, and Mansonia altissima.

**Table 3:** Distribution of Respondents on Readiness to practice Agro-forestry

| Response         | Frequency n=[50] | Percentage (%) |
|------------------|------------------|----------------|
| Willing          | 8                | 16             |
| Unwilling        | 11               | 22             |
| Lack of seed     | 20               | 40             |
| Scarcity of Land | 11               | 22             |

Respondent's distribution on readiness to practice Agro-forestry is represented In (Table 3). The result shows that Scarcity of land and lack of seed/planting materials are important factors that could influence the adoption of agro-forestry, this represent (22%) and (40%) respectively, (16%) of the respondents are willing to practice agro-forestry while (22%) are unwilling. From the study, the level of awareness is high but most farmers are not willing to practice agroforestry perhaps due to lack of seeds and insufficient land.

*Conclusion:* This study further proof that agro forestry practice is a practice that is essential to the reduction if not eradication of Land degradation. Also adoption of agro forestry will ensure food security among the ever increasing population.

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